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GROUP VERSUS INDIVIDUAL MEASURES.

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THE AUTHOR STATES THAT INFORMATION LOSS IN CURRICULUM EVALUATION IS RELATED TO THE ASSUMPTION THAT GROUP MEASURES AND AVERAGES OF INDIVIDUAL MEASURES ARE INTERCHANGEABLE IN YIELDING IDENTICAL INFORMATION. TYPES OF RELATIONSHIPS BETWEEN GROUP AND INDIVIDUAL MEASURES ARE LISTED. THE AUTHOR DISCUSSES ONE OF THESE TYPES OF RELATIONSHIPS, SPECIFICALLY, THE SITUATION IN WHICH THERE IS NO INDIVIDUAL MEASURE FROM WHICH THE GROUP MEASURE IS DERIVED, AND EXAMPLES OF THIS TYPE OF MEASURE. OF PRIMARY IMPORTANCE TO EVALUATION STUDIES IS THE EXTENT TO WHICH RESULTS WOULD BE ALTERED BY USING GROUP MEASURES INSTEAD OF, OR IN ADDITION TO, INDIVIDUAL MEASURES. SINCE VARIOUS MEASUREMENT CHOICES CAN RESULT IN DIFFERENT CONCLUSIONS AND RECOMMENDATIONS, CURRICULUM EVALUATION STUDIES SHOULD BE AUGMENTED TO INCLUDE BOTH INDIVIDUAL AND GROUP MEASURES OF VARIOUS TYPES. THESE VARIED APPROACHES WOULD YIELD DIFFERENT INFORMATION AND SHOULD PROVIDE A BETTER UNDERSTANDING OF THE COMPLEXITIES OF THE CLASSROOM SITUATION. THIS PAPER WAS PREPARED FOR THE SYMPOSIUM, "EVALUATION OF FEDERALLY FUNDED PROGRAMS IN OUR SCHOOLS," AT THE MEETING OF THE AMERICAN PERSONNEL AND GUIDANCE ASSOCIATION (DALLAS, MARCH 23, 1967). (FS)

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GROUP VERSUS INDIVIDUAL MEASURES*

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Support by Federal and private agencies has made possible curriculum development and evaluation projects of great scope and influence. The curriculum evaluator is no longer of necessity confined to the laboratory type study employing limited resources of materials and subjects. If generalization of his results to the real educational world is of an importance comparable to tight control of the experimental conditions, the evaluator may elect to conduct an extensive field study. At his disposal are the resources necessary to introduce new curriculum materials into large numbers of classrooms, should adequate tests of his hypotheses require it. If the logic of the situation requires that the classroom, the group of classrooms comprising the grade, or even the school be considered the experimental unit, such units can be obtained in numbers sufficient to perform statistical tests of adequate power.

The point I wish to discuss, however, has not to do with the relative advantages and disadvantages of laboratory and field studies, nor with the problems of determining optimum sample size. Rather I want to talk about a potential danger of information loss. This information loss is related to the assumption that group measures and averages of individual measures are interchangeable in the sense that they yield identical information.

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In order to understand this more fully, let me list a few types of relationships between group and individual measures:[1]

1. The individual measure is dichotomous, and the corresponding group measure is a proportion. Thus, the individual measure is discrete and the corresponding group measure is continuous. For example, the individual measure might be response (Right or Wrong) to a test item, and the corresponding group measure would be the proportion of the group passing that item.
2. The individual measure is a continuous variable, and the corresponding group measure is an average of the individual measures. For example, the individual measure might be total test score, and the corresponding measure would be mean score for the group.
3. The individual measure is a continuous variable, and the corresponding group measure is a distribution characteristic such as variance or skewness.
4. There is no individual measure from which the group measure is derived. One example from curriculum evaluation would be the use of a classroom climate variable, such as the authoritarian-permissive dimension, as a group measure.

Other types of relationships between individual and group measures can be distinguished, but the preceding abbreviated list is sufficient for present purposes.

Many types of information loss are caused by the failure to distinguish between group and individual measures of the first three types mentioned, but today I want to focus on measures of the fourth type only--the situation

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[1] Kendall, Patricia L. and Lazarsfeld, Paul F. "The Relation Between Individual and Group Characteristics in 'The American Soldier,'" in Lazarsfeld and Rosenberg (Eds), The Language of Social Research. Glencoe, Illinois: The Free Press, 1955, pp. 291-3.

in which there is no individual measure from which the group measure is derived. The practice of measuring each individual in the group and obtaining an average of these scores is so common as to make the foregoing statement sound somewhat strange. However, it is not difficult to identify group measures which have no individual counterpart. School systems often have ongoing testing programs whose primary function is to provide individual measures for guidance and placement purposes. Perhaps it is this easy availability of individual test scores which leads to the use of averages as the sole type of group measure for purposes of evaluation. My object is not, however, to encourage the use of one type of group measure at the expense of another. Rather, it is to suggest that the collection and appropriate analysis of many types of data within single studies would lead to a better understanding of the relationships among them, and therefore to an understanding of a wider variety of curriculum effects than we now investigate.

Let us consider some specific examples of group measures not derived from corresponding individual measures. At least two categories can be distinguished--those measures which involve group output and those which relate to conditions under which the group functions. These typically are treated as dependent and independent variables, respectively, in a curriculum evaluation study. One example of a group output measure might occur in a Science class discussing the implications of a given set of experimental data. The validity, or perhaps the creativeness, of the conclusion reached by the class would be a group output measure. Or perhaps a problem is posed to the same class, and the task is to plan and construct an experimental apparatus which will aid in its solution. In this case, the group output measure might be time required to successfully set up such an apparatus.

One can see that group measures of this type are to some extent affected by average class ability. However, they also reflect a leadership effect; that is, the extraordinary contribution of an individual or small group of individuals to the output of the class as a whole. As programmed learning techniques, and in particular computer-assisted instruction become more highly developed and technologically feasible for use in the schools, educators will have a real choice as to the proper use of the group in teaching. That is, the group learning situation will be employed when, and only when, unique educational outcomes can be attributed directly to it. It is quite likely that some of these unique educational outcomes will be expressed in terms of true group measures, rather than averages of individual measures. Thus, sharpening our thinking concerning these two types of measures will have effects on defining and selecting educational treatments, as well as on evaluating them.

The type of measure related to conditions under which the group functions is much more familiar to most of us. Many measures of the type to which I refer have to do with the characteristics of the teacher--his methods of presenting subject matter and his effect on the social climate of the classroom. Thus under this heading come such measures as teacher permissiveness, proportion of teacher time spent working with individuals, proportion of student response directly elicited by the teacher, and many others. These measures all have in common the characteristic that they reflect interactive effects between teacher and class which determine the learning situation for the group <u>as a whole</u>. Typically, data of this type are obtained by means of classroom observation techniques carried out by individuals who are not part of the group itself. However, there is another class of measures

related to conditions under which the group functions which is focussed more on the students themselves and less on the teacher. Under this heading, for example, would come measures of the degree to which the group itself controls the behavior of its members, the homogeneity of the group with respect to age, sex, and interests, and the number of self-initiated group projects carried out during a semester.

The preceding discussion has pointed out only a few of many group measures which might be used in evaluation studies, and which are not obtained by averaging individual measures. A question of primary importance to evaluation studies concerns the extent to which results would be altered had the decision been made to use a group measure instead of, or in addition to, individual measures. Suppose we are evaluating a program which, through various means, enables the teachers to spend a greater proportion of their time with individual students. We might want to find out the relationships, if any, between amount of individual attention and student attitude toward school. Let us assume for the present that we have developed and validated a satisfactory attitude instrument. Notice that we can express each of the variables of interest as either a group or an individual measure. Thus we can record the proportion of each student's time during which he receives individual attention, and we can convert this to a group measure by obtaining an average. We can likewise obtain individual attitude measures and average them, or alternatively, we could obtain a single rating of class attitude as a whole. If the study is a correlational one, we now have a choice between using students or groups as the unit on which the correlations are to be based. Moreover, we have two types of measures at the group level--averages of individual measures and measures of the group as a whole. As an

illustration of how the selection of measures could affect results, let us suppose that the individual attention rate varies among classes in the study. This is not an unreasonable assumption if one considers differences in class size and in methods of instruction among teachers of varying experience, background, and personality. Suppose further that individuals' attitudes are affected by the amount of attention they receive relative to the other members of their class. Neither is this unreasonable to believe. Under these circumstances, students in a class with a high rate of individual attention are apt to value their share of attention less, and resent a lack of attention more. This would result in classes having high individual attention rates but low attitude scores, a situation which could result in an apparent negative correlation at the group level. At the individual level, the correlation could easily be positive.

Many other examples could be cited. As I stated previously, it is not my intention to identify or argue for a single "best" procedure for selecting individual or group measures. Rather I have attempted to show that various choices can result in different conclusions and recommendations. I would suggest that curriculum evaluation studies be augmented to include both individual and group measures of various types. Presumably these various approaches would yield different information, and comparisons among the results should provide a better understanding of the complexities of the classroom situation.